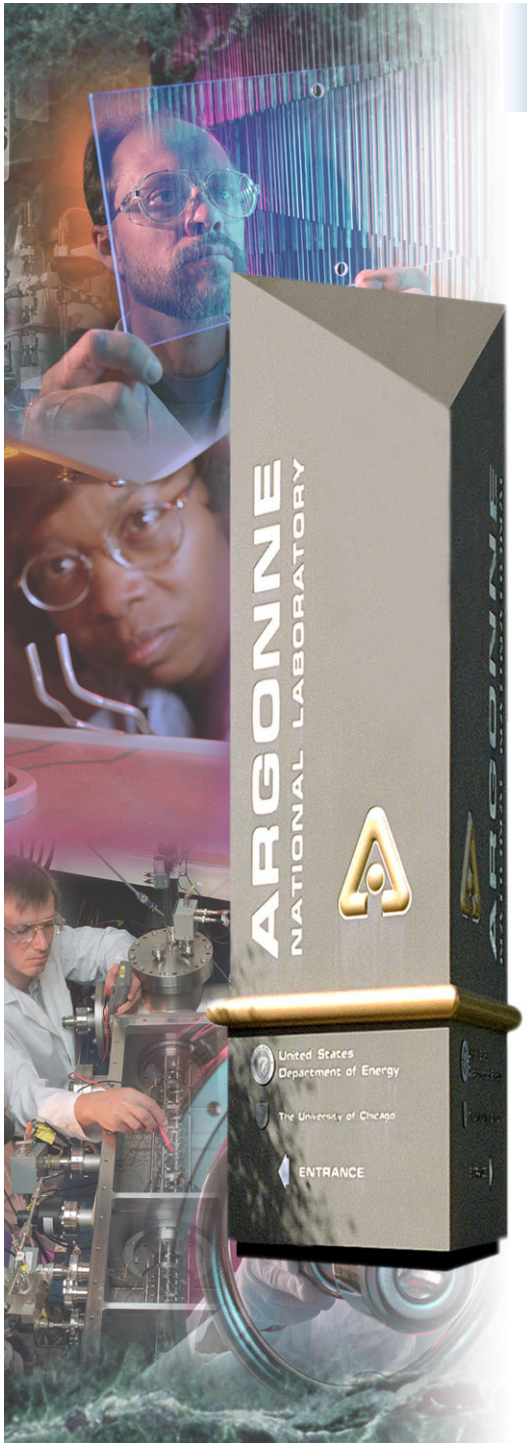

ARGONNE NATIONAL LABORATORY

Proposal Number **426**

PSS Generation 1 Upgrade was a combination of Projects 186 and 188

Safety Interlocks Group

October 2005

THE UNIVERSITY OF CHICAGO

Office of Science
U.S. DEPARTMENT OF ENERGY

Argonne National Laboratory is managed by
The University of Chicago for the U.S. Department of Energy

Project: (ASD 426) PSS Generation 1 Upgrade was a combination of Projects 186 and 188

Objective: The PSS Generation 1 design is being reviewed by the SIG. The anticipated results of this review will be a list of changes/upgrades to be made to the PSS G1 that will provide improved testability, better diagnostics and functionality that is more consistent with the PSS G3 design.

Background Information:

- New Initiative
- Multi Year Funding
- High priority

Justification:
The 44 beamlines that use the current PSS G1 system would experience shorter intervals to troubleshoot PSS problems and less time to validate the PSS during its annual testing.

Consequence:
The current beamline down time rate would likely stay the same or worsen due to aging hardware. User initiated changes to the PSS G1 code, which occur at a rate of about one per beamline per year, would require more effort to support than with the upgraded PSS G1 unit.

Requested Funds (FY06): $81.96 K (AIP)

FY	2006	2007	2008	Total
Noneffort	$81.96 K	$191.24 K	$131.14 K	$404.34 K
Existing Effort	$402.91 K	$325.75 K	$248.58 K	$977.24 K
New Effort				
Total	$484.87 K	$516.99 K	$379.71 K	$1,381.57 K

The PSS G1 Review Results suggest the following types of upgrades:

- Provide “hooks” to inject test signals without removing field device connectors => improve reliability & testing.
- Replace some point to point wiring with PCB’s for ease of diagnostics and better reliability.
- Address PLC hardware obsolescence.
- Replace LOVE controllers with analog modules
- Add visual signs to indicate station status.
- Improve the PSS G1 interface to beamline and front end shutters
- Modify the PLC code to provide better diagnostics for troubleshooting and improved EPICS interface.
    - Latch PSS Chain B faults
    - Cross trip between chains A and B
    - Build more modular PLC code